

**CAREY WATER AND SEWER DISTRICT (PWS 5070010)  
SOURCE WATER ASSESSMENT FOR NEW SOURCES (New Well, Tag  
#D0034183 and Waterford Well, Tag #D0030213) FINAL REPORT**

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**August 26, 2005**



**State of Idaho  
Department of Environmental Quality**

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## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Carey Water and Sewer District for New Sources (New Well, Tag #D0034183 and Waterford Well, Tag #D0030213), Carey, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Carey Water and Sewer District (PWS #5070010) drinking water system consists of one actively used source, Well #1. Two new sources are being added to the drinking water system, the New Well, Tag #D0034183 and the Waterford Well, Tag #D0030213. The system currently serves approximately 500 people through 170 connections.

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other category(ies) results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of overall susceptibility, Waterford Well rated moderate susceptibility for IOCs, VOCs, SOCs, and microbial bacteria. System construction and hydrologic sensitivity rated moderate susceptibility for the well, and land use rated high susceptibility for IOCs, VOCs, and SOCs, and moderate susceptibility for microbial contaminants (Table 1).

In terms of overall susceptibility, New Well rated high susceptibility for IOCs, VOCs, SOCs, and moderate susceptibility for microbial bacteria. System construction and hydrologic sensitivity both rated moderate susceptibility for the well, and land use rated high susceptibility for IOCs, VOCs, and SOCs, and moderate susceptibility for microbial contaminants (Table 1).

The State Drinking Water Information System (SDWIS) only contains data for New Well. No VOCs, SOCs, or microbial bacteria have been detected in New Well's water. Traces of the IOC nitrate have been detected; however concentrations are significantly lower than maximum contaminant levels (MCLs) as set by the Environmental Protection Agency (EPA).

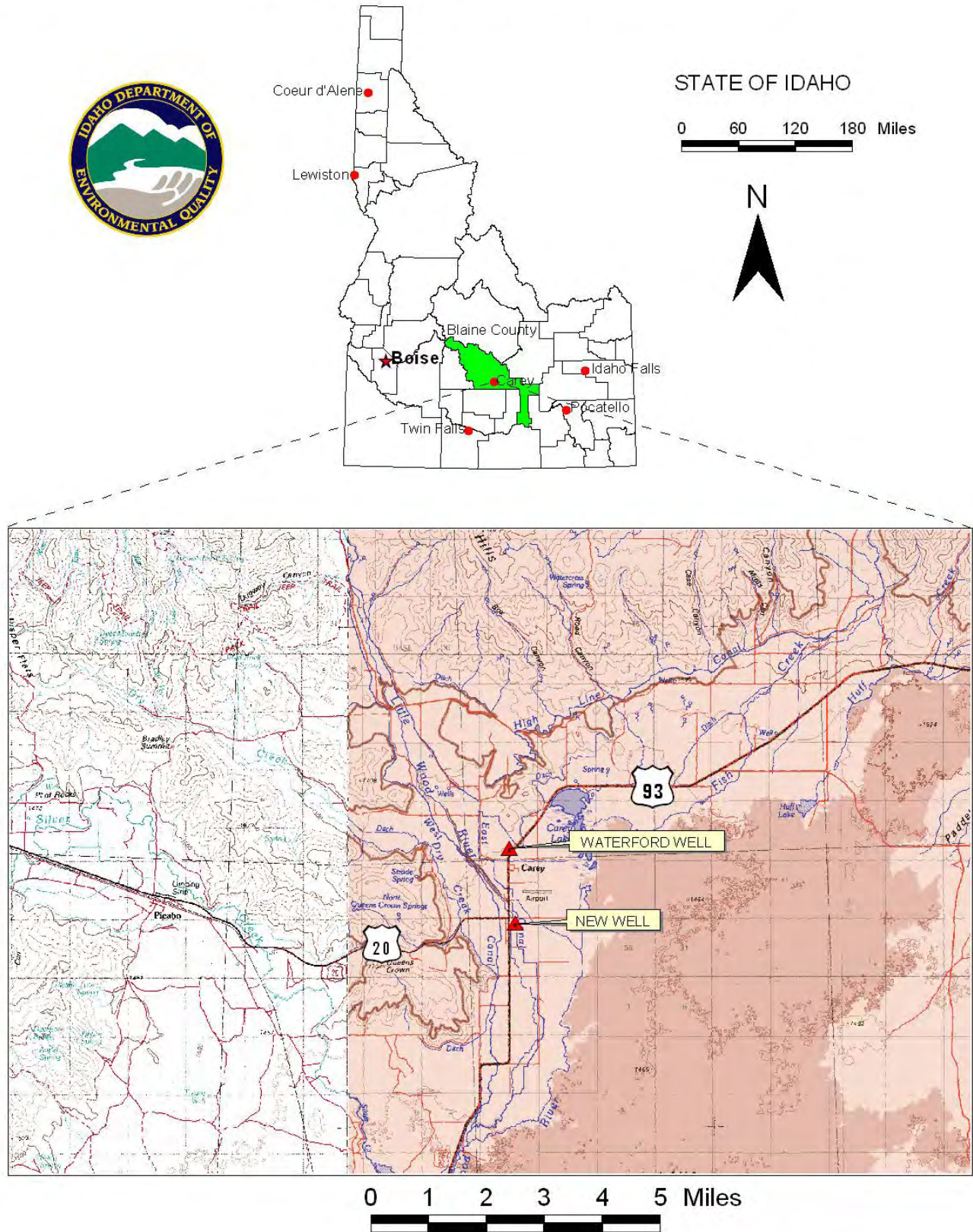
This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Carey Water and Sewer District, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). Actions should be taken to maintain a 50-foot radius circle around the wellheads clear of potential contaminants. Any contaminant spills within the delineation should be carefully monitored and dealt with. As much of the designated assessment areas are outside the direct jurisdiction of Carey Water and Sewer District, collaboration and partnerships with state and local agencies should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation contains some urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Department of Environmental Quality or the Idaho Rural Water Association.

**FIGURE 1 Site Vicinity Map of Carey Water and Sewer District Wells**



# **SOURCE WATER ASSESSMENT FOR CAREY WATER AND SEWER DISTRICT, CAREY, IDAHO**

## **Section 1. Introduction - Basis for Assessment**

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

### **Background**

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

### **Level of Accuracy and Purpose of the Assessment**

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments for sources active prior to 1999 were completed by May of 2003. SWAs for sources activated post-1999 are being developed on a case-by-case basis. The resources and time available to accomplish assessments are limited. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

## **Section 2. Conducting the Assessment**

### **General Description of the Source Water Quality**

The Carey Water and Sewer District (PWS #5070010) drinking water system consists of one actively used source Well #1. Two new sources are being added to the drinking water system, the New Well, Tag #D0034183 and the Waterford Well, Tag #D0030213. The system currently serves approximately 500 people through 170 connections..

The SDWIS only contains data for New Well. No VOCs, SOC, or microbial bacteria have been detected in New Well's water. Traces of the IOC nitrate have been detected; however concentrations are significantly lower than MCLs as set by the EPA.

### **Defining the Zones of Contribution – Delineation**

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ performed the delineation using a computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Snake River Plain aquifer in the vicinity of the Carey Water and Sewer District. The computer model used site-specific data from a variety of sources including local area well logs, and hydrogeologic reports (detailed below).

### **Hydrogeologic Conceptual Model**

The wells are located in the Little Wood River Valley near Carey, Idaho where the Little Wood River leaves the northern mountains and flows onto the Eastern Snake River Plain.

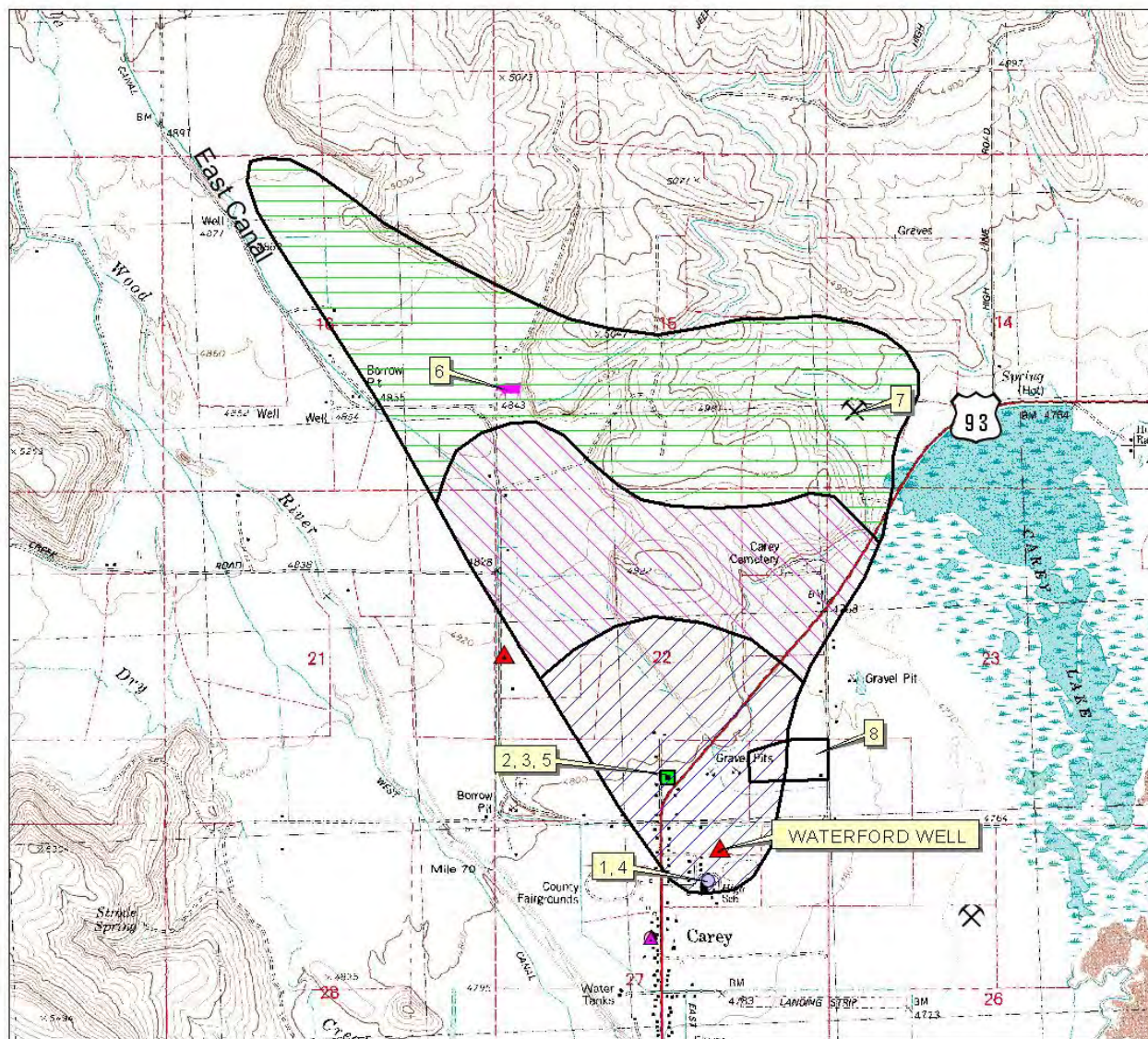
Ground water flows from the alluvium of the Little Wood River Valley into the basalt of the regional ESRP (Eastern Snake River Plain) aquifer. The alluvium of the river valley overly the basalt along the margin of the Snake River Plain and extend only a short distance onto the plain. Ground water in the alluvium may be 200 ft above the regional water level in the basalt until the sands and gravels terminate along the margin. Water levels drop rapidly along the margin of the plain. Water levels in the regional aquifer a few miles away are about 4200 ft while water levels near Carey are 4700 ft. Underflow from the river valley may be 24,000 acre-ft a year (Cosgrove, et. al. 1999).

Carey Lake, 2 miles east of Carey, is a lake that formed in a shallow depression when ground water levels rose during wet years.

Ground water in the ESRP flows from northeast to southwest perpendicular to the margins of the Plain and the inflow from the Little Wood River. The hydraulic conductivity of the Snake River basalt may be 10 times greater than the sands and gravels of the alluvium.



Figure 2. City of Carey Delineation Map and Potential Contaminant Source Locations



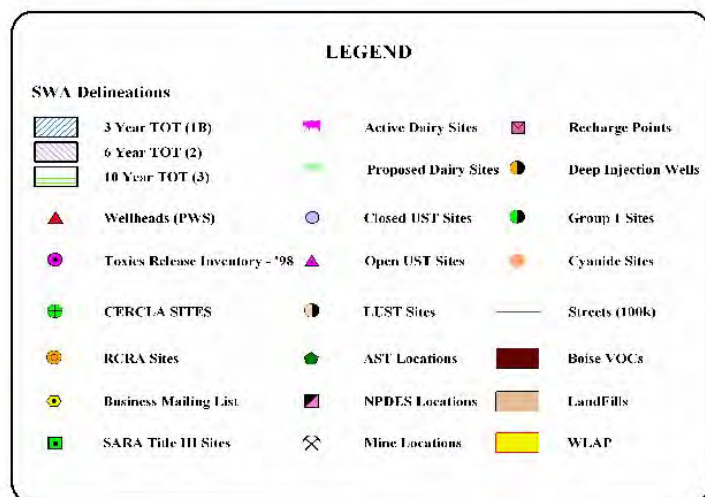
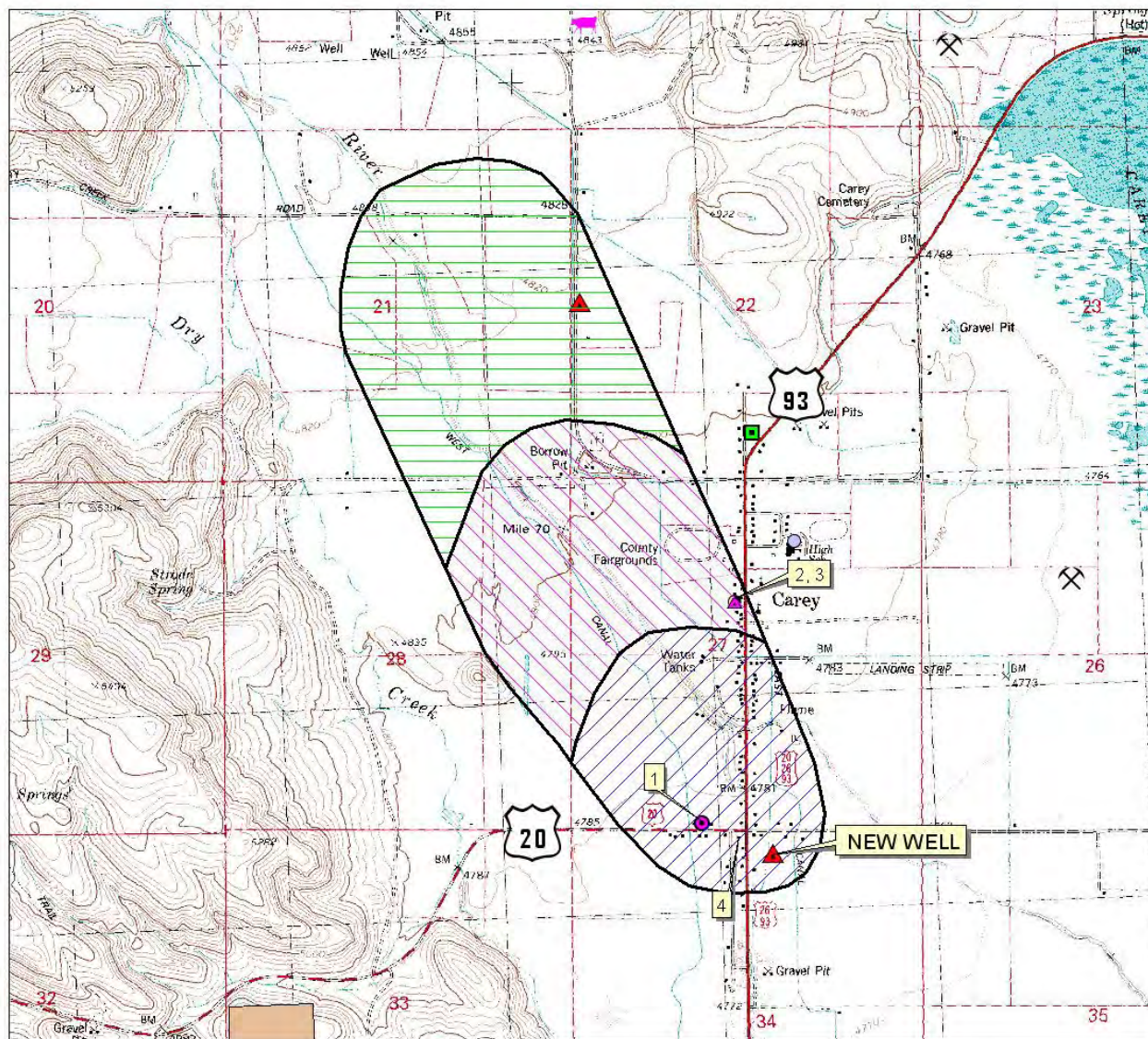
0 0.5 1 Miles



**PWS# 5070010**  
**WATERFORD WELL**



Figure 3. City of Carey Delineation Map and Potential Contaminant Source Locations



0 0.5 1 Miles



**PWS# 5070010**  
**New Well**



The wells are constructed in several hundred feet of sand and gravel that overly the basalt, very near the margin of the plain. The productivity of the sands and gravels is high so there is usually no need to drill deeper into the basalt except along the margins where the alluvium thins and disappears. The water level in the wells completed in the alluvium is above the water level in the ESRP so that the primary source of water to the wells is ground water in the river valley. Even wells that penetrate the basalt near the margin are generally above the ESRP water level and derive their water from the river valley underflow.

### **Model Description**

The modeled area consists of the river alluvium bounded by no-flow boundaries of Challis Volcanics on the west and east. A fixed head boundary represents the upstream boundary on the river valley. A pair of fixed head boundaries represents the water levels along the margins of the ESRP.

The hydraulic conductivity of the alluvium was estimated from well driller's pump test to be about 9 ft/day. The hydraulic conductivity of the basalt was assumed to be about 100 ft/day.

The model boundaries were adjusted to get a good fit to the selected test wells.

The delineated area for the Waterford Well is a north-trending sector approximately 2.5 miles long and 2 miles wide. New Well's delineation is a northeast trending lobe approximately 2.5 miles long and 0.75 miles wide. The actual data used in determining the source water assessment delineation area is available from DEQ upon request.

### **Identifying Potential Sources of Contamination**

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source; this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods which water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

## **Contaminant Source Inventory Process**

A two-phased contaminant inventory of the study area was conducted June and July 2005. The first phase involved identifying and documenting potential contaminant sources within the Carey Water and Sewer District source water assessment areas (Figure 2 and 3) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the delineated areas.

In this case, DEQ databases identified 10 potential contaminant sources within the delineated areas (Figure 2 and 3). These sources include underground storage tanks, a dairy, and a toxics release inventory site. Highway 20 and 93, the Little Wood River and other surface water bodies were also considered a potential source of contaminants due to their potential for transporting contaminants. These sources could potentially contribute IOCs, VOCs, SOCs, or microbial bacteria to ground water. In addition, the system operator indicated a new gas station and a sheep farm within the delineated areas.

## **Section 3. Susceptibility Analyses**

The well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix A contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility ranking.

### **Hydrologic Sensitivity**

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Both Carey Water and Sewer District wells rated moderate for hydrologic sensitivity. The Natural Resource Conservation Service characterized areas soils as poorly- to moderately-drained, a setting which is more protective of ground water because it minimizes the vertical mobility of surface-related potential contaminants. Well logs for both wells indicated that the vadose zones in each well are composed of predominantly permeable materials, water table depths are less than 300 feet below ground surface (bgs), and aquitards are not present above the producing zone of either well.

## Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well borehole is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

Waterford Well was drilled in 2004 to a depth of 293 feet below ground surface (bgs). A 14-inch diameter (0.375 inches thick) casing extends 228 feet bgs into “weakly cemented sand and gravel” and a 10-inch casing (0.365 inches thick) extends from 196 feet bgs to 261 feet bgs into “coarse sand and gravel”. The well is screened from 198 feet bgs and 260 feet bgs. A bentonite seal was placed to 80 feet bgs into gravel.

Waterford Well rated moderate susceptibility for system construction. The well is located outside of a 100-year floodplain, and according to the well log, the highest production comes from more than 100 feet below static water depth. The moderate rating was received because the casing and annular seal do not extend into low permeability units, and because a sanitary survey has not been conducted on this well, it is unknown if the surface seal and wellhead are maintained.

New Well was drilled in 2004 to a depth of 218 feet bgs. A 10.75-inch diameter (0.365 inches thick) casing extends from the surface to 180 feet bgs into “coarse sand and gravel”. The well is screened from 178 feet bgs to 218 feet bgs within an unconfined aquifer. A bentonite seal was placed to 60 feet bgs into gravel.

New Well rated moderate susceptibility for system construction. The well is located outside of a 100-year floodplain. The moderate rating was received because, according to the well log, production comes from less than 100 feet below static water depth, the casing and annular seal do not extend into low permeability units, and because a sanitary survey has not been conducted on this well, it is unknown if the surface seal and wellhead are maintained.

Current PWS well construction standards can be more stringent than when a well(s) was constructed. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the regulations deal with screening requirements, aquifer pump tests, use of a down-turned casing vent, and thickness of casing. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Because neither well’s construction meets all current standards, each well was assessed an additional system construction point.



## Potential Contaminant Sources and Land Use

Land use for both Waterford Well and New Well rated high susceptibility for IOCs, VOCs, SOC, and moderate susceptibility for microbial bacteria. The high percentage of agricultural lands and the overall number and type of potential contaminant sources contributed the highest amount to the ratings (Table 2 and Table 3).

## Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a wellhead will automatically lead to a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) contribute greatly to the overall ranking.

**Table 1. Summary of Carey Water and Sewer District Susceptibility Evaluation**

Well	Susceptibility Scores <sup>1</sup>									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Waterford Well	M	H	H	H	M	M	M	M	M	
New Well	M	H	H	H	M	M	H	H	M	

<sup>1</sup>H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility, IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

## Susceptibility Summary

In terms of overall susceptibility, Waterford Well rated moderate susceptibility for IOCs, VOCs, SOC, and microbial bacteria. System construction and hydrologic sensitivity rated moderate susceptibility for the well, and land use rated high susceptibility for IOCs, VOCs, and SOC, and moderate susceptibility for microbial contaminants (Table 1).

In terms of overall susceptibility, New Well rated high susceptibility for IOCs, VOCs, SOC, and moderate susceptibility for microbial bacteria. System construction and hydrologic sensitivity both rated moderate susceptibility for the well, and land use rated high susceptibility for IOCs, VOCs, and SOC, and moderate susceptibility for microbial contaminants (Table 1).

SDWIS only contains data for New Well. No VOCs, SOC, or microbial bacteria have been detected in New Well's water. Traces of the IOC nitrate have been detected; however concentrations are significantly lower than MCLs as set by the EPA.

## **Section 4. Options for Drinking Water Protection**

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility rating a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Carey Water and Sewer District, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. Actions should be taken to keep a 50-foot radius circle clear around the wellheads. Any spills within the delineation should be carefully monitored and dealt with. As much of the designated protection area is outside the direct jurisdiction of Carey Water and Sewer District, making collaboration and partnerships with state and local agencies and industry groups are critical to the success of drinking water protection. The well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A public education program should be a primary focus of any drinking water protection plan as the delineation is near residential land uses areas. Public education topics could include proper household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the DEQ or the Idaho Rural Water Association.

## **Assistance**

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office      (208) 736-2190

State DEQ Office                              (208) 373-0502

Website: <http://www.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper ([mlharper@idahoruralwater.com](mailto:mlharper@idahoruralwater.com)), Idaho Rural Water Association, at 1-208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.



## POTENTIAL CONTAMINANT INVENTORY

### LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100-year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

## References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1999, Idaho Source Water Assessment Plan, October, 39 p.

Cosgrove, M. D., 1999. Description of the IDWR/UI Snake River Plain Aquifer Model, Idaho Water Resource Research Institute, Moscow, Idaho, p. 94.

## Appendix A

# Carey Water and Sewer District Susceptibility Analysis Worksheets



The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5    Low Susceptibility

6 - 12   Moderate Susceptibility

≥ 13    High Susceptibility

1. System Construction		SCORE			
Drill Date	10/23/2004				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	NO				
Well meets all IDWR construction standards	NO	1			
Wellhead and surface seal maintained	UNK	1			
Casing and annular seal extend to low permeability unit	NO	1			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		3			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		4			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED AGRICULTURE	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	4	5	5	2
(Score = # Sources X 2 ) 8 Points Maximum		8	8	8	4
Sources of Class II or III leacheable contaminants or	YES	4	4	4	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	25-50% Agricultural Land	2	4	2	2
Potential Contaminant Source / Land Use Score - Zone I		14	14	14	6
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	>50% Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		23	23	23	8
Total Potential Contaminant Source / Land Use Score		5 (H)	5 (H)	5 (H)	2 (M)
4. Final Susceptibility Source Score		12 (M)	12 (M)	12 (M)	9 (M)
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

1. System Construction		SCORE			
Drill Date	7/29/2004				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	NO				
Well meets all IDWR construction standards	NO	1			
Wellhead and surface seal maintained	UNK	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		4			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED AGRICULTURE	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	4	4	2
(Score = # Sources X 2 ) 8 Points Maximum		6	8	8	4
Sources of Class II or III leacheable contaminants or	YES	7	3	3	
4 Points Maximum		4	3	3	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	>50% Agricultural Land	4	4	4	4
Potential Contaminant Source / Land Use Score - Zone I		14	15	15	8
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	>50% Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0
Cumulative Potential Contaminant / Land Use Score		24	25	25	10
Total Potential Contaminant Source / Land Use Score		5 (H)	5 (H)	5 (H)	3 (M)
4. Final Susceptibility Source Score		13 (H)	13 (H)	13 (H)	11 (M)
5. Final Well Ranking		High	High	High	Moderate

## Appendix B

### Table 2 and Table 3 Potential Contaminant Inventories

**Table 2. Carey Water and Sewer District, Waterford Well, Potential Contaminant Inventory**

SITE	Source Description <sup>1</sup>	TOT <sup>2</sup> ZONE	Source of Information	Potential Contaminants <sup>3</sup>
1, 4	LUST Site (cleanup completed; impact unknown), UST Site	0-3 YR	Database Search	VOC, SOC
2, 3, 5	LUST Site (cleanup completed; impact unknown), UST Site, SARA Site	0-3 YR	Database Search	IOC, SOC
6	Dairy; 163 cows	6-10 YR	Database Search	IOC, SOC
7	Geothermal Mine	6-10 YR	Database Search	None
8	Sheep Farm	0-3 YR	Database Search	IOC, VOC, SOC, Microbials
	East Canal	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials
	Highway 93	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials
	Carey Lake	6-10 YR	GIS Map	IOC, VOC, SOC

<sup>1</sup> UST Site = Underground Storage Tank, LUST = Leaking Underground Storage Tank, SARA = Superfund Authorization Recovery Act

<sup>2</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>3</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

**Table 3. Carey Water and Sewer District, New Well, Potential Contaminant Inventory**

SITE	Source Description <sup>1</sup>	TOT <sup>2</sup> ZONE	Source of Information	Potential Contaminants <sup>3</sup>
1	TRI Site	0-3 YR	Database Search	IOC, VOC, SOC
2, 3	LUST Site (cleanup completed; impact unknown), UST Site	3-6 YR	Database Search	VOC, SOC
4	UST Site	6-10 YR	Database Search	VOC, SOC
	Little Wood River	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials
	Highway 93 and 20	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials

<sup>1</sup> UST Site = Underground Storage Tank, LUST = Leaking Underground Storage Tank, SARA = Superfund Authorization Recovery Act

<sup>2</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>3</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical